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Bigger than Botox?

Kathleen Hou | November 2023

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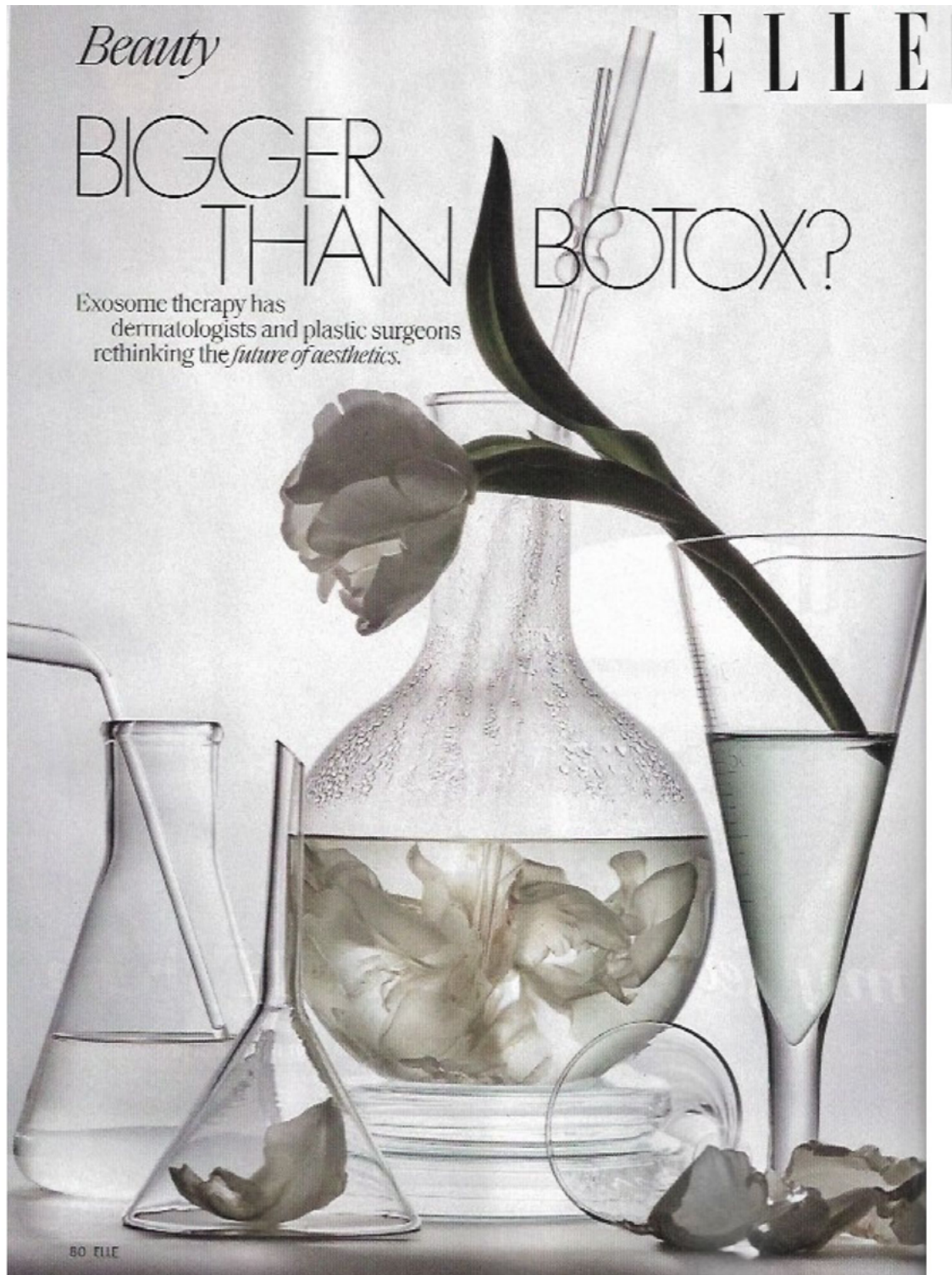
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WHEN JENNIFER LEVINE WOULD VISIT aquariums as a little girl, she would spend hours watching starfish slowly tumble across the glass. Starfish are naturally intriguing to children, but it was their ability to regrow arms that really fascinated young Jennifer. These days, Levine—she grew up to become a leading New York City plastic surgeon—can do just about any aesthetic procedure. But it is dermatology's newest hot topic, exosome therapy, that reminds her of the starfish she grew up watching, with their magically regenerative bodies.

Exosomes are nano-size vesicles (sort of like little care packages) that cells excrete to communicate with each other. They are packed with lipids, proteins, and nucleic acids, like messenger RNA. In aesthetics, they are generally sourced from stem cells, specialized cells that have the ability to develop into many other types of cells. Exosomes have been explored in regenerative medicine to repair cartilage and joints, and many doctors now believe exosomes hold promise for regenerating and repairing skin, and even restoring hair growth.

The idea is that when injected or used topically, exosomes might help skin not only look better, but also behave like younger skin on a deep cellular level. As we grow older, our body's ability to heal, including its power to produce collagen, decreases. "We've seen that [exosomes] have anti-inflammatory and regenerative properties and signal cells to do things they're supposed to do—like make more collagen. It leads to an improvement in skin texture, thickness, and quality," says Catherine Chang, MD, a plastic and reconstructive surgeon and founder of Privé Beverly Hills. Exosomes are not yet FDA-approved (in July 2020, the agency issued a consumer alert on them and other stem-cell-derived products), and some experts feel that we're years out from FDA approval, but that hasn't stopped doctors from dreaming big.

"It could be bigger than Botox, and the holy grail in anti-aging," says Steven H. Williams, MD, president of the American Society of Plastic Surgeons. Compared to bio-stimulatory tools such as Sculptra and radio frequency, which also encourage collagen production, exosome therapy can stimulate growth without creating an injury or swelling that requires healing. And in contrast to platelet-rich plasma (PRP) therapy, its most commonly compared-to cousin, exosomes can contain more growth factors and are somewhat more widely available. The platelets for PRP need to be spun from an individual patient's own blood and will contain fewer growth factors as patients age, but exosomes can be derived from plants, animals, or humans, and even from donated blood or fat, and are, in that sense, ageless.

Anecdotally, Chang and Levine, who both offer exosome therapy topically in their practices, tell me that they and their patients have been blown away by the results. Chang used it herself following a CO2 laser treatment and found that it decreased her redness from seven days to one. One of her patients, who'd been trying to regrow her hair for a couple of years, excitedly came in following one exosome session and showed Chang her new hair. Levine has used it on patients to help heal things like stitching wounds, deep skin gashes from running falls in Central Park, and a large bruise from an airport luggage accident.

It's precisely because exosomes can be so powerful that Williams says we need more research on them. Among many other recent studies on exosomes, a review of early preclinical research in the August 2022 *Journal of Dermatologic Surgery* found that exosomes have promising skin rejuvenation and

hair growth effects, but that inconsistency in the ways they are purified, and practical issues with how they are sourced, stored, scaled, and reproduced, are hindering their adoption in the clinical sphere. Jason Diamond, MD, a Beverly Hills plastic surgeon, cautions, "The biggest factor is making sure that they come from a reputable lab, because there can be contamination and infection risks, and they're frankly hard to produce consistently." Outside of beauty, there's the potential that exosomes could one day be used for delivery of antibiotics or even anticancer agents, he notes. Still, Williams adds that because exosomes affect communication between cells, we need more studies to better understand the likelihood of scenarios in which they could trigger cell signaling problems and result in outcomes like undesired cell replication, cell death, or cancer.

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"It also seems that some people are taking advantage of some of the excitement about it to try to get some economic gain, and that's not always in the patient's best interest," he cautions. It's easy to find clinics and wellness centers offering exosome therapy at prices varying from \$60 to \$6,000. But if you don't know the right questions to ask, you could be wasting your money (at the very least). For example, Williams explains, fat-derived exosomes are generally the easiest to obtain. But "if you're trying to use a fat-derived exosome for hair growth, you're probably not going to see results, because it's a different signaling mechanism: You're trying to communicate with a different part of the cell to influence it."

Many dermatologists have heard of exosome therapy from conferences and studies—and like many skin innovations, it's been available in South Korea for a few years. Youngwoo Ro, MD, founder of the renowned Oracle dermatology clinic in Seoul, tells me he first heard of it in aesthetics about five years ago. In South Korea, exosomes are a common add-on to Fraxel or microneedling, where the microchannels help them get into deeper layers of the skin. Exosome skin boosters are another popular treatment, containing a cocktail of ingredients like hyaluronic acid, amino acids, collagen peptides, and glutathione, for additional "brightening, firming effects," says David Kim, MD, of Idriss Dermatology in New York City. He tells me that ASCE+ is a popular exosome product: the subtype SRLV is for skin and HRLV is for hair, and both contain exosomes derived from roses.

"We're just at the tip of the iceberg," Levine says. "This is certainly the direction that the field of aesthetics is going into." Williams agrees, but worries about that iceberg. "Science shows that there's something there, but we're not sure what it is. That doesn't mean that physicians can't use non-FDA-approved treatments. But they need to be a little bit more careful. Patients should always be cautious about being the first one ever to try something. Sometimes it doesn't work out as well." —KATHLEEN HOU

Editor's Note: This article does not constitute individual medical advice, and you should consult with your doctor before deciding if certain cosmetic or medical treatments are right for you.